PROJECT HIGHLIGHTS

Region: East Asia and Pacific
Country: Indonesia

Focus Area:
Risk Identification
Risk assessments (community-based, probabilistic modeling); risk mapping; information campaigns, public outreach, etc.

Preparing Communities through Understanding Risk

Utilizing the Indonesia Scenario Assessment for Emergencies

Overview

Investing in preparedness saves lives. However, it is often challenging to prioritize and implement preparedness measures without risk information and the tools to support effective decision-making. Disaster managers and planners in local governments face many barriers to accessing and utilizing up-to-date and accurate hazard and risk assessments. The Indonesia Scenario Assessment for Emergencies (InaSAFE) bridges this gap by providing a practical tool for local officials to develop actionable contingency plans. InaSAFE enables communities, disaster managers and planners to effectively combine local wisdom with scientific knowledge to produce realistic scenarios for a range of natural hazards, including floods, earthquakes, volcanoes and tsunamis, in order to enhance planning and disaster preparedness.

Challenges

Exposed to multiple hazards, Indonesia is one of the most vulnerable countries in the world. In the last five years, the country experienced 6,421 disaster-related events, affecting 10.5 million people.* Understanding the spatial impacts and the ability to develop realistic disaster scenarios can help risk managers and urban planners in their planning, preparation and response to disasters. However, limited risk data, low capacity in producing and using geospatial data, as well as the lack of coordination and sharing of risk information among stakeholders, the public, academia and civil sectors, inhibit the ability to better prepare for emergency events and guide development to safer areas.

Approach

Usable by anyone with basic computer skills, InaSAFE is a simple yet rigorous tool to identify risks by calculating and then visualizing the spatial impact of a given hazard on communities and their infrastructure. A risk-based methodology was adopted to analyze the spatial extent of a hazard, including its relative severity, which is then related to probable impacts. To calculate probable impacts, the analysis requires the input of two parameters: (i) hazard (e.g., volcano, earthquake, tsunami, flood, cyclone); and (ii) exposure (people or critical assets, e.g., such as schools, hospitals, fire stations, bridges).

InaSAFE asks a series of questions about potential disaster scenarios and then produces maps and reports estimating the potential damage caused to people and infrastructure along with providing recommended actions for emergency managers. InaSAFE has been designed to take into account variables, such as gender and other vulnerable groups, as part of the impact analysis. The sources of data required by InaSAFE include hazard data from technical agencies, demographic information from the national census and community knowledge captured through participatory mapping tools such as OpenStreetMap. It is a flexible tool that can be quickly and easily customized to fit specific needs. Currently, InaSafe is integrated with desktop-based open source software, Quantum GIS, and is being adapted for the web using the open-source GeoNode platform.

Highlights

InaSAFE is an innovative approach to understanding and communicating hazard impacts.

InaSAFE is usable by anyone with basic computer skills.

InaSAFE is a free and publicly available tool which supports communities, disaster managers and planners in disaster planning and preparedness.

InaSAFE asks a series of questions about a potential disaster, produces maps with estimated potential damages to people and infrastructure, and emergency recommendations.

InaSAFE has been used to produce estimation of the impact of earthquakes in Yogyakarta, a tsunami in Padang, and for community-level scenarios for Jakarta flood emergency planning.

*From records: http://dibi.bnpb.go.id/DesInventar/dashboard.jsp

Results

• The InaSAFE initiative started as a partnership with the Indonesian National Disaster Agency (BNPB) to support local disaster management agencies in emergency planning. Successfully tested during the 2012 flood season in Jakarta, the tool was rapidly rolled out nationally by BNPB.

• InaSAFE was officially launched and presented to the President of Indonesia, Susilo Bambang Yudhoyono, at the 5th Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR) in October 2012. A beta version, presented at the Understanding Risk Conference in July 2012, was downloaded over 1,000 times, underscoring the fact that InaSAFE was well-received by its many users.

• InaSAFE is being used in diverse environments – ranging from flood scenarios in the complex megacity of Jakarta to understanding potential earthquake and tsunami impacts in the rural community of Manokwari in West Papua.

• With the help of Humanitarian OpenStreetMap Team, participatory mapping tools were used to collect high-resolution data on critical infrastructure in Jakarta. The collected information was analyzed using InaSAFE during the 2012 Jakarta flood contingency planning. This information can now be openly accessed and used for future emergency and planning exercises. Across the entire country, nearly half a million buildings have been mapped in the OpenStreetMap platform and can be used for InaSAFE analyses.

• Developing and using InaSAFE strengthens the technical capacity and skills of users. Thus far, trainings have taken place in 5 provinces with over 130 participants from local disaster management agencies, universities and civil society.

Partnership

InaSAFE has been developed in partnership with BNPB, the Australia-Indonesia Facility for Disaster Reduction (AIFDR), GFDRR Labs and the World Bank East Asia and Pacific DRM team through the Australian Agency for International Development (AusAID) and the East Asia Infrastructure for Growth Trust Fund (EAAIG). InaSAFE also supports the World Bank's Open Data for Resilience Initiative (OpenDRI).

Next Steps

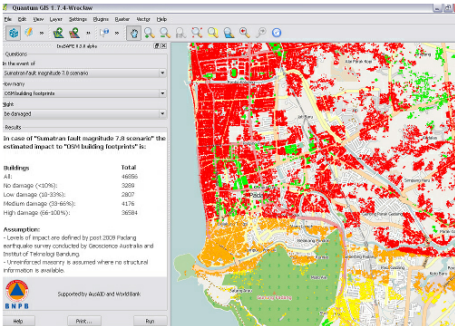
The InaSAFE initiative is committed to investing in open source software, which is freely available to the public for use and adaptation. Adopting the "SAFE" approach can save agencies time and resources in developing spatial analytics, risk assessment and hazard impact modeling tools. A number of governments in the region are interested in adapting and refining the SAFE tools, including the Department of Science and Technology in the Philippines, and partners in Lao PDR and Mongolia. Risk and software experts from the World Bank/GFDRR, the Global Earthquake Model, AusAID/AIFDR, Geoscience Australia, the European Commission Joint Research Centre, the UN World Food Program/ITHACA, and OpenGeo recently met in November 2012 during a five day "code sprint" to further develop the functionality of the open source SAFE platform upon which InaSAFE is based. Based on feedback and new feature requests from users and partners, Version 2.0 of InaSAFE is expected to be released in May 2013.

LEARN MORE

News Story: Preparing Nations to be a Step Ahead (http://www.gfdrr.org/gfdrr/node/1454)
News Story: First International InaSafe Code Sprint (http://www.gfdrr.org/gfdrr/node/1416)
Website: OpenDRI (http://www.gfdrr.org/gfdrr/opendri)

CONTACT
Abigail Baca, Disaster Risk Management Consultant, The World Bank
abaca@worldbank.org

Produced and edited by Abigail Baca, Liana Zanarisoa Razafindrazay, Zuzana Stanton-Geddes and Christina Irene, The World Bank.



To be able to address vulnerability, the first step is to understand and identify the risk.

"The InaSAFE tools improve disaster preparedness in Indonesia by providing a new way to combine scientific hazard information and community knowledge on disaster risk."

Dody Ruswandi
Deputy for Disaster Reduction and Preparedness
National Agency for Disaster Management
Government of Indonesia

Lessons Learned

A consistent and easy-to-use interface allows users, even those with little training, to quickly and easily load new hazard and exposure data for analysis using simple, customizable impact functions.

The effectiveness of risk assessment and preparedness activities are increased when the community is directly engaged through participatory mapping and by using open and accessible tools.

The openness and scalability of a tool can save other users time and resources in developing a risk assessment methodology and hazard impact modeling tools.